IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
REQUEST FOR FILING NATIONAL PHASE OF
PCT APPLICATION UNDER 35 U.S.C. 371 AND 37 CFR 1.494 OR 1.495

To: Hon. Commissioner of Patents
Washington, D.C. 20231

00909

TRANSMITTAL LETTER TO THE UNITED STATES DESIGNATED/ELECTED OFFICE (DO/EO/US)

Atty Dkt: P 290428 /2990517US/W/kop
M# /Client Ref.

From: Pillsbury Winthrop LLP, IP Group:

Date: December 28, 2001

This is a **REQUEST** for **FILING** a PCT/USA National Phase Application based on:

1. International Application	2. International Filing Date	3. Earliest Priority Date Claimed
PCT/FI00/00627	6 July 2000	7 July 1999
⇧ country code	Day MONTH Year	Day MONTH Year (use item 2 if no earlier priority)

4. Measured from the earliest priority date in item 3, this PCT/USA National Phase Application Request is being filed within:

(a) ☐ 20 months from above item 3 date (b) ☒ 30 months from above item 3 date,

(c) Therefore, the due date (unextendable) is January 7, 2002

5. Title of Invention NOISE SUPPRESSOR UNIT

6. Inventor(s) NUUTINEN

Applicant herewith submits the following under 35 U.S.C. 371 to effect filing:

7. ☒ Please immediately start national examination procedures (35 U.S.C. 371 (f)).

8. ☒ **A copy of the International Application** as filed (35 U.S.C. 371(c)(2)) is transmitted herewith (file if in English but, if in foreign language, file only if not transmitted to PTO by the International Bureau) including:

a. ☒ Request;
b. ☒ Abstract;
c. 7 pgs. Spec. and Claims;
d. 1 sheet(s) Drawing which are ☐ informal ☒ formal of size ☒ A4 ☐ 11"

9. ☒ **A copy of the International Application has been transmitted by the International Bureau.**

10. **A translation of the International Application** into English (35 U.S.C. 371(c)(2))
a. ☐ is transmitted herewith including: (1) ☐ Request; (2) ☐ Abstract;
(3) _____ pgs. Spec. and Claims;
(4) _____ sheet(s) Drawing which are:
☐ informal ☐ formal of size ☐ A4 ☐ 11"
b. ☒ is not required, as the application was filed in English.
c. ☐ is not herewith, but will be filed when required by the forthcoming PTO Missing Requirements Notice per Rule 494(c) if box 4(a) is X'd or Rule 495(c) if box 4(b) is X'd.
d. ☐ Translation verification attached (not required now).

RE: USA National Phase Filing of PCT /FI00/00627

11. ☒ Please see the attached Preliminary Amendment

12. ☐ Amendments to the claims of the International Application **under PCT Article 19 (35 U.S.C. 371(c)(3)), i.e., before 18th month from first priority date above in item 3, are transmitted herewith (file only if in English) including:**

13. ☒ PCT Article 19 claim amendments (if any) have been transmitted by the International Bureau

14. ☐ Translation of the amendments to the claims **under PCT Article 19 (35 U.S.C. 371(c)(3)), i.e., of claim amendments** made before 18th month, **is attached (required by 20th month from the date in item 3 if box 4(a) above is X'd, or 30th month if box 4(b) is X'd, or else amendments will be considered canceled).**

15. **A declaration of the inventor** (35 U.S.C. 371(c)(4))
a. ☐ is submitted herewith ☐ Original ☐ Facsimile/Copy
b. ☒ is not herewith, but will be filed when required by the forthcoming PTO Missing Requirements Notice per Rule 494(c) if box 4(a) is X'd or Rule 495(c) if box 4(b) is X'd.

16. **An International Search Report (ISR):**
a. Was prepared by ☐ European Patent Office ☐ Japanese Patent Office ☒ Other
b. ☒ has been transmitted by the international Bureau to PTO.
c. ☒ copy herewith (1 pg(s).) ☒ plus Annex of family members (1 pg(s).).

17. **International Preliminary Examination Report** (IPER):
a. ☒ has been transmitted (if this letter is filed after 28 months from date in item 3) in English by the International Bureau with Annexes (if any) in original language.
b. ☐ copy herewith in English.
c.1 ☐ IPER Annex(es) in original language ("Annexes" are amendments made to claims/spec/drawings during Examination) including attached amended:
c.2 ☐ Specification/claim pages #___ claims #
Dwg Sheets #
d. ☐ Translation of Annex(es) to IPER **(required by 30th month due date, or else annexed amendments will be considered canceled).**

18. **Information Disclosure Statement** including:
a. ☒ Attached Form PTO-1449 listing documents
b. ☒ Attached copies of documents listed on Form PTO-1449
c. ☒ A concise explanation of relevance of ISR references is given in the ISR.

19. ☐ **Assignment** document and Cover Sheet for recording are attached. Please mail the recorded assignment document back to the person whose signature, name and address appear at the end of this letter.

20. ☐ Copy of Power to IA agent.

21. ☐ **Drawings** (complete only if 8d or 10a(4) not completed): __ sheet(s) per set: ☐ 1 set informal; ☐ Formal of size ☐ A4 ☐ 11"

22. Small Entity Status ☒ is **Not** claimed ☐ is claimed (**pre**-filing confirmation required)
22(a) ___ (No.) Small Entity Statement(s) enclosed (since 9/8/00 Small Entity Statements(s) not essential to make claim)

23. **Priority** is hereby claimed under 35 U.S.C. 119/365 based on the priority claim and the certified copy, both filed in the International Application during the international stage based on the filing in (country) FINLAND of:

	Application No.	Filing Date		Application No.	Filing Date
(1)	991558	July 7, 1999	(2)		
(3)			(4)		
(5)			(6)		

a. ☒ See Form PCT/IB/304 sent to US/DO with copy of priority documents. If copy has not been received, please proceed promptly to obtain same from the IB.
b. ☐ Copy of Form PCT/IB/304 attached.

RE: USA National Phase Filing of PCT/FI00/00627

24. Attached: PRELIMINARY AMENDMENT, SUBSTITUTE SPECIFICATION

25 Per Item 17.c2, **cancel original** pages #___, claims #___, Drawing Sheets #

26. **Calculation of the U.S. National Fee (35 U.S.C. 371 (c)(1)) and other fees is as follows:**
Based on amended claim(s) per above item(s) ☐ 12, ☐ 14, ☐ 17, ☐ 25 (hilite)

Total Effective Claims	10	minus 20 =	0	x $18/$9	=	$0	966/967
Independent Claims	1	minus 3 =	0	x $84/$42	=	$0	964/965
If any proper (ignore improper) Multiple Dependent claim is present,				add$280/$140		+0	968/969

BASIC NATIONAL FEE (37 CFR 1.492(a)(1)-(4)): →→ **BASIC FEE REQUIRED, NOW** →→→→

A. If country code letters in item 1 are **not** "US","BR","BB","TT","MX","IL" "NZ", "IN" or "ZA"

See item 16 re:

1.	Search Report was not prepared by EPO or JPO ----------	add$1,040/$520	960/961
2.	Search Report was prepared by EPO or JPO ----------	add$890/$445	+1040 970/971

SKIP B, C, D AND E UNLESS country code letters in item 1 are "US","BR","BB","TT","MX","IL", "NZ", "IN", "ZA", "LC" or "PH"

☐ → (X)	☐ B.	If USPTO did not issue both International Search Report (ISR) and (if box 4(b) above is X'd) the International Examination Report (IPER), ----------	add$1,040/$520	+0 960/961
(only) (one) → (of)	☐ C.	If USPTO issued ISR but not IPER (or box 4(a) above is X'd), ----------	add$740/$370	+0 958/959
(these) (4) → (boxes)	☐ D.	If USPTO issued IPER but IPER Sec. V boxes not all 3 YES, ----------	add$710/$355	+0 956/957
→	☐ E.	If international preliminary examination fee was paid to USPTO and Rules 492(a)(4) and 496(b) satisfied (in IPER Sec. V all 3 boxes must be YES for all claims), --	add $100/$50	+0 962/963
27.			**SUBTOTAL =**	$1040
28.	If Assignment box 19 above is X'd, add Assignment Recording fee of ----$40			+0 (581)
29.	If box 15a is x'd, determine whether inventorship on Declaration is different than in international stage. If yes, add (per Rule 497(d)		----$130	+0 (098)
30.	Attached is a check to cover the ----------		**TOTAL FEES**	$1040

Our Deposit Account No. 03-3975
Our Order No. 60258 (C#) | 290428 (M#)

00909

CHARGE STATEMENT: The Commissioner is hereby authorized to charge any fee specifically authorized hereafter, or any missing or insufficient fee(s) filed, or asserted to be filed, or which should have been filed herewith or concerning any paper filed hereafter, and which may be required under Rules 16-18 and 492 (missing or insufficient fee only) now or hereafter relative to this application and the resulting Official document under Rule 20, or credit any overpayment, to our Account/Order Nos. shown above for which purpose a duplicate copy of this sheet is attached.
This CHARGE STATEMENT does not authorize charge of the issue fee until/unless an issue fee transmittal form is filed

Pillsbury Winthrop LLP
Intellectual Property Group

By Atty: Christine H. McCarthy **Reg. No.** 41844

Sig: _____ **Fax:** (703) 905-2500

Atty/Sec: CHM/JRH **Tel:** (703) 905-2143

NOTE: File in duplicate with 2 postcard receipts (PAT-103) & attachments.

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re National Stage Application of PCT/FI00/00627

NUUTINEN

Group Art Unit: Not Yet Assigned

Appln. No.: Not Yet Assigned

Examiner: Not Yet Assigned

Filed: December 28, 2001

FOR: NOISE SUPPRESSOR UNIT

* * * * *

December 28, 2001

PRELIMINARY AMENDMENT

Hon. Commissioner of Patents
Washington, DC 20231

Sir:

Before beginning examination, kindly amend the above-identified application as follows:

IN THE SPECIFICATION:

Please replace the original specification with the enclosed substitute specification, which is in U.S. format with paragraph numbering.

On page 1 of the substitute specification, just after the title, please insert the following paragraph:

--This is the U.S. National Stage of PCT/FI00/00627, which was filed on July 6, 2000 in the English language.--

IN THE CLAIMS:

Please amend claims 1-10 as follows:

1. (Amended) A noise suppressor unit for installing and mounting a common mode choke for a noise suppressor onto a circuit board, the common mode choke for the noise suppressor comprising a toroid coiled with at least two coils, which coils have two coil ends, wherein the noise suppressor unit comprises

a circuit board holder, onto which the toroid is positioned, the toroid being coiled with at least two coils,

the circuit board holder comprising connecting plates, wherein one coil end at the most is or more coil ends are connected to each connecting plate and wherein the connecting plates are intended to be surface mounted to mounting surface areas in the circuit board, and wherein the connecting plates are electrically insulated from each other, and

lifting means for an assembly head or the like of an automatic assembly machine for placing the noise suppressor unit onto the circuit board by the automatic assembly machine or the like.

2. (Amended) A noise suppressor unit as claimed in claim 1, wherein the connecting plates are so dimensioned and designed that the toroid is apart from the connecting plates.

3. (Amended) A noise suppressor unit as claimed in claim 1, wherein each connecting plate comprises an upper connecting plate, to which one coil end at the most is connected, and a lower connecting plate, which is in an electrical connection with the upper connecting plate and which is intended to be surface mounted to mounting surface areas in the circuit board.

4. (Amended) A noise suppressor unit as claimed in claim 3, wherein the upper connecting plates are so dimensioned and designed that the toroid is apart from the upper connecting plates.

5. (Amended) A noise suppressor unit as claimed in claim 3, wherein the lower connecting plates are substantially rectangular.

6. (Amended) A noise suppressor unit as claimed in claim 1, wherein it comprises two coils and four connecting plates.

7. (Amended) A noise suppressor unit as claimed in claim 6, wherein the circuit board holder is substantially rectangular and that each connecting plate is located at one corner of the circuit board holder.

8. (Amended) A noise suppressor unit as claimed in claim 1, wherein the connecting plates are made of copper or copper metal.

9. (Amended) A noise suppressor unit as claimed in claim 1, wherein the lifting means are in the middle opening of the toroid.

10. (Amended) A noise suppressor unit as claimed in claim 9, wherein the lifting means are on the surface of the circuit board holder.

See the attached Appendix for changes to effect the above claims.

REMARKS

A substitute specification in U.S. format has been enclosed to replace the original PCT specification. The undersigned submits and certifies that no new matter is added by the submission of the substitute specification. A marked-up substitute specification will follow shortly.

Claims 1-10 are pending in this National Stage application. By this amendment, these claims were amended to conform to U.S. practice, *e.g.,* to remove reference numerals and multiple dependencies. No new material was added to either the specification or to the claims.

Attached hereto is a marked-up version of the changes made to the claims by the current amendment. The attached Appendix is captioned **"VERSION WITH MARKINGS TO SHOW CHANGES MADE"**.

Respectfully submitted,

PILLSBURY WINTHROP LLP

By:_____

Christine H. McCarthy
Reg. No.:41844
Tel. No.: (703) 905-2143
Fax No.: (703) 905-2500

CHM\jrh

1600 Tysons Boulevard
McLean, VA 22102
(703) 905-2000

Enclosures: Appendix
Substitute Specification

APPENDIX

VERSION WITH MARKINGS TO SHOW CHANGES MADE

IN THE SPECIFICATION:

Priority claim is recited in new paragraph just after the title on page 1.

IN THE CLAIMS:

1. (Amended) A noise suppressor unit [(1)] for installing and mounting a common mode choke for a noise suppressor onto a circuit board [(3)], the common mode choke for the noise suppressor comprising a toroid [(4)] coiled with at least two coils [(5)], which coils [(5)] have two coil ends [(6)],

[characterized in that] wherein the noise suppressor unit comprises

a circuit board holder [(7)], onto which the toroid [(4)] is positioned, the toroid being coiled with at least two coils [(5)],

the circuit board holder [(7] comprising connecting plates [(8)], wherein one coil end [(6)] at the most is or more coil ends [(6)] are connected to each connecting plate [(8)] and wherein the connecting plates [(8)] are intended to be surface mounted to mounting surface areas in the circuit board [(3)], and wherein the connecting plates [(8)] are electrically insulated from each other, and

lifting means [(9)] for an assembly head or the like of an automatic assembly machine for placing the noise suppressor unit [(1)] onto the circuit board [(3)] by the automatic assembly machine or the like.

2. (Amended) A noise suppressor unit as claimed in claim 1, [characterized in that] wherein the connecting plates [(8)] are so dimensioned and designed that the toroid [(4)] is apart from the connecting plates [(8)].

3. (Amended) A noise suppressor unit as claimed in claim 1, [characterized in that] wherein each connecting plate [(8)] comprises an upper connecting plate [(10)], to which one coil end [(6)] at the most is connected, and a lower connecting plate [(11)], which is in an electrical connection with the upper connecting plate [(10)] and which is intended to be surface mounted to mounting surface areas in the circuit board [(3)].

4. (Amended) A noise suppressor unit as claimed in claim 3, [characterized in that] wherein the upper connecting plates [(10)] are so dimensioned and designed that the toroid [(4)] is apart from the upper connecting plates [(10)].

5. (Amended) A noise suppressor unit as claimed in claim 3, [characterized in that] wherein the lower connecting plates [(11)] are substantially rectangular.

6. (Amended) A noise suppressor unit as claimed in claim 1, [characterized in that] wherein it comprises two coils [(5)] and four connecting plates [(8)].

7. (Amended) A noise suppressor unit as claimed in claim 6, [characterized in that] wherein the circuit board holder [(7)] is substantially rectangular and that each connecting plate [(8)] is located at one corner of the circuit board holder [(7)].

8. (Amended) A noise suppressor unit as claimed in claim 1, [characterized in that] wherein the connecting plates [(8)] are made of copper or copper metal.

9. (Amended) A noise suppressor unit as claimed in claim 1, [characterized in that] wherein the lifting means [(9)] are in the middle opening of the toroid [(4)].

10. (Amended) A noise suppressor unit as claimed in claim 9, [characterized in that] wherein the lifting means [(9)]are on the surface of the circuit board holder [(7)].

APPLICATION UNDER UNITED STATES PATENT LAWS

Atty. Dkt. No. PW 290428
(M#)

Invention: NOISE SUPPRESSOR UNIT

Inventor (s): Sami NUUTINEN

00909
Pillsbury Winthrop LLP

This is a:

- ☐ Provisional Application
- ☐ Regular Utility Application
- ☐ Continuing Application
  - ☐ The contents of the parent are incorporated by reference
- ☒ PCT National Phase Application
- ☐ Design Application
- ☐ Reissue Application
- ☐ Plant Application
- ☐ Substitute Specification
  Sub. Spec Filed _____
  in App. No. /
- ☐ Marked up Specification re
  Sub. Spec. filed _____
  In App. No /

SPECIFICATION

NOISE SUPPRESSOR UNIT

BACKGROUND OF THE INVENTION

The invention relates to a noise suppressor unit for installing and mounting a common mode choke for a noise suppressor onto a circuit board, the common mode choke for the noise suppressor comprising a toroid coiled with at least two coils, which coils have two coil ends.

The noise suppressor unit according to the invention can be applied, for example, to installation and mounting of a common mode choke for a noise suppressor in a power source module onto a circuit board of the power source module, the module being arranged onto a circuit board of a plug-in unit. A power source module is a separate current delivery device positioned onto a circuit board of a plug-in unit, the device comprising a circuit board for the power source module. Owing to the structure, which comprises two stacked circuit boards, the power source module only allows the use of especially low components in order for the combination to fit into the card slot reserved for it.

Especially the operation of a power source causes much electromagnetic noise. The European Commission EMC directive (89/336/EEC) on electric devices determines that no device must not be disturbed by other devices nor must it disturb other devices. In the current and future telecommunications community, the fulfilment of the requirements of the directives is of utmost importance, and also constitutes a competitive advantage. If electromagnetic noise cannot be filtered in the power source module, it propagates and may cause malfunction in the plug-in unit. As a result of this, the operation of the entire system may be disturbed. For this reason, for preventing the propagation of noise, the interface between the power source and the plug-in unit must comprise a noise filter having, among other things, a common mode choke for a noise suppressor of the power source module. The operation of the noise filter is reciprocal.

Common mode chokes for noise suppressors have previously been disposed on the circuit board of a plug-in unit. Common mode chokes for noise suppressors have previously been manually positioned onto the circuit board of the plug-in unit, and the ends of the choke coils have been soldered into openings on the circuit board of the plug-in unit.

When components are assembled onto a circuit board by modern

production methods, the above conventional method cannot be used. A common mode choke for a noise suppressor has to be able to be assembled automatically and surface mounted.

BRIEF DESCRIPTION OF THE INVENTION

It is thus an object of the invention to provide a noise suppressor unit to solve the above problems.

The objects of the invention are achieved by a noise suppressor unit, which is characterized in that the noise suppressor unit comprises a circuit board holder, onto which the toroid is positioned, the toroid being coiled with at least two coils, the circuit board holder comprising connecting plates, wherein one coil end at the most is or more coil ends are connected to each connecting plate and wherein the connecting plates are intended to be surface mounted to mounting surface areas in the circuit board, and wherein the connecting plates are electrically insulated from each other, and lifting means for an assembly head or the like of an automatic assembly machine for placing the noise suppressor unit onto the circuit board by the automatic assembly machine or the like.

The preferred embodiments of the invention are disclosed in the dependent claims.

The invention is based on placing and mounting the common mode choke for the noise suppressor onto the circuit board holder so as to achieve a noise suppressor unit which functions as an installation and mounting holder of the common mode choke for the noise suppressor. This circuit board holder provides a common mode choke for a noise suppressor, which is both automatically assembled and surface mounted.

Such packages are commercially available that allow automated assembly and surface mounting of a common mode choke for a noise suppressor, but owing to the two-piece holder+cover structure of the packages, the components become too high and exceed the maximum height allowed for components, especially in cases where the common mode choke for the noise suppressor is a common mode choke for a noise suppressor in a power source module, the choke being positioned onto a circuit board of the power source module arranged onto a circuit board of a plug-in unit. In the noise suppressor unit of the invention the component height does not create a problem, since the circuit board can be made thin.

The noise suppressor unit of the invention also provides the advantage that it has a simple structure; the circuit board holder, for instance, is made of one piece. Owing to the simplicity of the circuit board holder it is advantageous to manufacture.

Due to the circuit board structure and the connecting plates in the circuit board holder, the noise suppressor unit of the invention does not comprise any mounting feet, like the conventional surface mounted/mountable components do, and therefore the surface area taken by the common mode choke for the noise suppressor remains small.

The connecting plates of the circuit board holder cool and efficiently transfer the heat caused by the common mode choke for the noise suppressor to the cooling layers of the circuit board of the power source. Efficient cooling enables the use of the circuit board holder in high-power applications.

BRIEF DESCRIPTION OF THE DRAWINGS

In the following the invention will be described in greater detail in connection with preferred embodiments with reference to the attached drawings, in which

Figure 1 shows a power source module arranged onto a plug-in unit,

Figure 2 is a top view of a noise suppressor unit,

Figure 3 is a bottom view of the noise suppressor unit,

Figure 4 is a side view of the noise suppressor unit.

DETAILED DESCRIPTION OF THE INVENTION

The invention relates to a noise suppressor unit 1 for installing and mounting a common mode choke (not marked with a reference number) for a noise suppressor onto a circuit board 3.

Figure 1 shows a structure in which the circuit board 3 is a circuit board of a power source module, the circuit board being arranged onto a circuit board 2 of a plug-in unit.

The common mode choke for the noise suppressor comprises a toroid 4 coiled with at least two coils 5 such that each coil 5 has two coil ends 6.

The noise suppressor unit 1 comprises a circuit board holder 7, upon which the toroid 4 coiled with at least two coils 5 is positioned.

The circuit board holder 7 comprises connecting plates 8. One coil end 6 at the most is or more coil ends 6 are connected to each connecting plate 8. This means that one or more coil ends 6 can be connected to one connecting plate 8, or no coil end 6 is connected thereto. The connecting plates 8 are also intended to be surface mounted to mounting surface areas, such as copper areas (not shown), on the circuit board 3. The connecting plates 8 are electrically insulated from each other.

The noise suppressor unit 1 further comprises lifting means 9 for an assembly head (not shown) or the like of an automatic assembly machine for placing the noise suppressor unit 1 onto the circuit board 3 by the automatic assembly machine or the like (not shown).

The connecting plates 8 are preferably so dimensioned and designed that the toroid 4 is apart and does not touch the connecting plates 8. Such a solution provides a better functioning noise suppressor unit 1.

Each connecting plate 8 comprises more preferably an upper connecting plate 10, to which one coil end 6 at the most is connected, and a lower connecting plate 11, which is in an electrical connection with the upper connecting plate 10 and which is intended to be surface mounted to conductors in the circuit board 3. The upper connecting plate 10 can, for example, be connected to the lower connecting plate 11 by a circuit board through (not shown).

The circuit board holder 7 is preferably a two-layer circuit board.

In Figure 2, the upper connecting plates 10 are so dimensioned and designed that the toroid 4 is apart and does not touch the upper connecting plates 10. Such a solution provides a better functioning noise suppressor unit 1.

In Figure 3, the lower connecting plates 11 are substantially rectangular.

The upper connecting plates 10 and the lower connecting plates 11 are preferably made as big as possible so as to cool more efficiently and to transfer the heat caused by the common mode choke for the noise suppressor to the cooling layers (not shown) of the circuit board of the power source.

The common mode choke for the noise suppressor shown in Figure 2 comprises two coils 5 and four connecting plates 8.

The circuit board holder 7 shown in the figures is substantially rectangular. Each connecting plate 8 is located at one corner of the circuit board holder 7.

The connecting plates 8 are preferably made of copper or copper metal.

The lifting means 9 are preferably in the middle opening 12 of the toroid 4 and preferably on the surface of the circuit board holder 7. This solution provides a simple noise suppressor unit 1.

The noise suppressor unit 1 of the invention is assembled and mounted onto the circuit board 3 for example in the following manner. The lifting means 9, from which a strainer of the assembly machine grabs the noise suppressor unit 1, are in the middle opening 12 of the toroid 4 on the surface of the circuit board holder 7. The diameter of the strainer (not shown) of the assembly machine can be about a half of the diameter of the middle opening 12 of the toroid 4. During assembling the strainer of the assembly machine is pushed into the middle opening 12 of the toroid 4 and grabs the upper surface of the circuit board holder 7 for example with its suction head and transfers the noise suppressor unit 1 from a component pallet (not shown) to the circuit board 3. On the circuit board 3 of the power supply module, each connecting plate 8 of the noise suppressor unit 1 is connected to a corresponding copper surface area (not shown) on the circuit board 3 by means of a copper joint, for example. Thus, each coil end 6 of the common mode choke for the noise suppressor has the same electric potential as the corresponding copper surface area at the bottom of the noise suppressor unit 1 of the invention.

It is obvious to those skilled in the art that as technology advances, the basic idea of the invention may be implemented in a variety of ways. Accordingly, the invention and its embodiments are not restricted to the above-described examples, but may vary within the scope of the claims.

CLAIMS

1. A noise suppressor unit (1) for installing and mounting a common mode choke for a noise suppressor onto a circuit board (3), the common mode choke for the noise suppressor comprising a toroid (4) coiled with at least two coils (5), which coils (5) have two coil ends (6),

characterized in that the noise suppressor unit (1) comprises

a circuit board holder (7), onto which the toroid (4) is positioned, the toroid being coiled with at least two coils (5),

the circuit board holder (7) comprising connecting plates (8), wherein one coil end (6) at the most is or more coil ends (6) are connected to each connecting plate (8) and wherein the connecting plates (8) are intended to be surface mounted to mounting surface areas in the circuit board (3), and wherein the connecting plates (8) are electrically insulated from each other, and

lifting means (9) for an assembly head or the like of an automatic assembly machine for placing the noise suppressor unit (1) onto the circuit board (3) by the automatic assembly machine or the like.

2. A noise suppressor unit as claimed in claim 1, **characterized** in that the connecting plates (8) are so dimensioned and designed that the toroid (4) is apart from the connecting plates (8).

3. A noise suppressor unit as claimed in claim 1, **characterized** in that each connecting plate (8) comprises an upper connecting plate (10), to which one coil end (6) at the most is connected, and a lower connecting plate (11), which is in an electrical connection with the upper connecting plate (10) and which is intended to be surface mounted to mounting surface areas in the circuit board (3).

4. A noise suppressor unit as claimed in claim 3, **characterized** in that the upper connecting plates (10) are so dimensioned and designed that the toroid (4) is apart from the upper connecting plates (10).

5. A noise suppressor unit as claimed in claim 3, **characterized** in that the lower connecting plates (11) are substantially rectangular.

6. A noise suppressor unit as claimed in claim 1, **characterized** in that it comprises two coils (5) and four connecting plates (8).

7. A noise suppressor unit as claimed in claim 6, **character-**

ized in that the circuit board holder (7) is substantially rectangular and that each connecting plate (8) is located at one corner of the circuit board holder (7).

8. A noise suppressor unit as claimed in claim 1, **characterized** in that the connecting plates (8) are made of copper or copper metal.

9. A noise suppressor unit as claimed in claim 1, **characterized** in that the lifting means (9) are in the middle opening (12) of the toroid (4)

10. A noise suppressor unit as claimed in claim 9, **characterized** in that the lifting means (9) are on the surface of the circuit board holder (7).

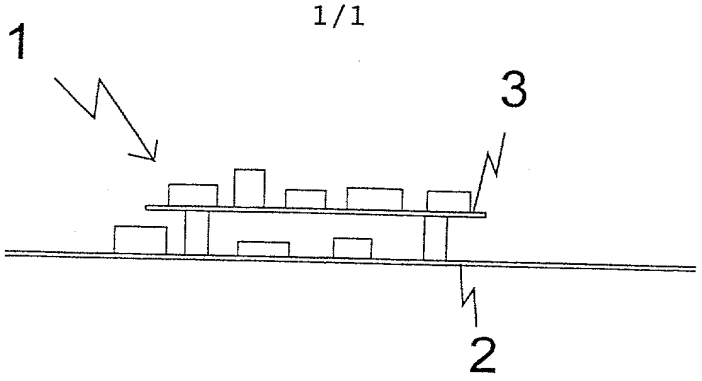

FIG 1

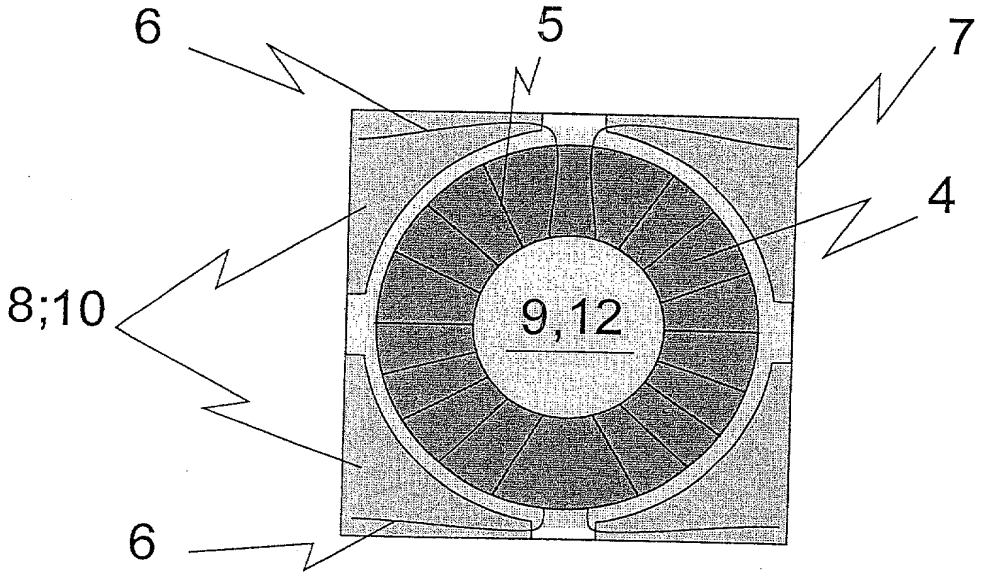

FIG 2

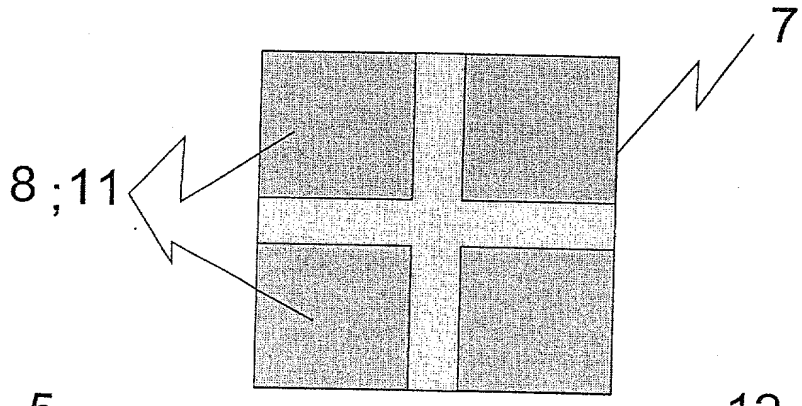

FIG 3

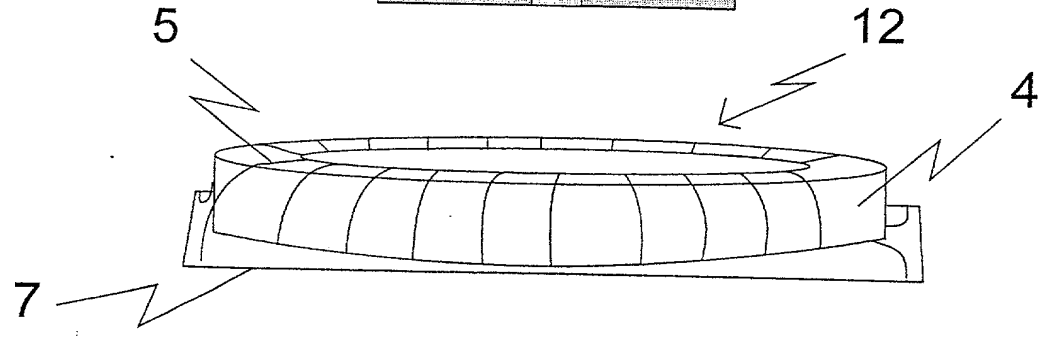

FIG 4

Patent Application 15 FEB 2002

FOR UTILITY/DESIGN CIP/PCT NATIONAL/PLANT ORIGINAL/SUBSTITUTE/SUPPLEMENTAL DECLARATIONS

RULE 63 (37 C.F.R. 1.63) DECLARATION AND POWER OF ATTORNEY FOR PATENT APPLICATION IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

PW FORM

As a below named inventor, I hereby declare that my residence, post office address and citizenship are as stated below next to my name, and I believe I am the original, first and sole inventor (if only one name is listed below) or an original, first and joint inventor (if plural names are listed below) of the subject matter which is claimed and for which a patent is sought on the **INVENTION ENTITLED Noise suppressor unit** the specification of which (CHECK applicable BOX(ES))

X A. ☐ is attached hereto.

BOX(ES) → B. ☐ was filed on _____ as U.S. Application No. _____ /

→ → C. ☒ was filed as PCT International Application No. PCT/ FI00 / 00627 on 6 July 2000

and (if applicable to U.S. or PCT application) was amended on _____

I hereby state that I have reviewed and understand the contents of the above identified specification, including the claims, as amended by any amendment referred to above. I acknowledge the duty to disclose all information known to me to be material to patentability as defined in 37 C.F.R. 1.56. Except as noted below, I hereby claim foreign priority benefits under 35 U.S.C. 119(a)-(d) or 365(b) of any foreign application(s) for patent or inventor's certificate, or 365(a) of any PCT International Application which designated at least one other country than the United States, listed below and have also identified below any foreign application for patent or inventor's certificate, or PCT International Application, filed by me or my assignee disclosing the subject matter claimed in this application and having a filing date (1) before that of the application on which priority is claimed, or (2) if no priority claimed, before the filing date of this application:

PRIOR FOREIGN APPLICATION(S) Number	Country	Day/MONTH/Year Filed	Date first Laid-open or Published	Date Patented or Granted	Priority NOT Claimed
991558	Finland	7 July 1999			

If more prior foreign applications, X box *at bottom* and continue on attached page.

Except as noted below, I hereby claim domestic priority benefit under 35 U.S.C. 119(e) or 120 and/or 365(c) of the indicated United States applications listed below and PCT international applications listed above or below and, if this is a continuation-in-part (CIP) application, insofar as the subject matter disclosed and claimed in this application is in addition to that disclosed in such prior applications, I acknowledge the duty to disclose all information known to me to be material to patentability as defined in 37 C.F.R. 1.56 which became available between the filing date of each such prior application and the national or PCT international filing date of this application:

PRIOR U.S. PROVISIONAL, NONPROVISIONAL AND/OR PCT APPLICATION(S) Application No. (series code/serial no.)	Day/MONTH/Year Filed	Status pending, abandoned, patented	Priority NOT Claimed

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

And I hereby appoint Pillsbury Winthrop LLP, Intellectual Property Group, telephone number (202) 861-3000 (to whom all communications are to be directed), and persons of that firm who are associated with USPTO Customer No. 909 (see below label) individually and collectively my attorneys to prosecute this application and to transact all business in the Patent and Trademark Office connected therewith and with the resulting patent, and I hereby authorize them to delete from that Customer No. names of persons no longer with their firm, to add new persons of their Firm to that Customer No., and to act and rely on instructions from and communicate directly with the person/assignee/attorney/firm/ organization who/which first sends/sent this case to them and by whom/which I hereby declare that I have consented after full disclosure to be represented unless/until I instruct the above Firm and/or an attorney of that Firm in writing to the contrary.

USE ONLY FOR PILLSBURY WINTHROP

00909

(1) **INVENTOR'S SIGNATURE:** Sami W [signature] **Date:** 12/10/01

Name	Sami		NUUTINEN
	First	Middle Initial	Family Name
Residence	Santa Rosa CA 95404	USA	Finland
	City	State/Foreign Country (USA)	Country of Citizenship
Mailing Address	2130 Bedford St #301		
(include Zip Code)	Santa Rosa, CA 95404 USA		

(2) **INVENTOR'S SIGNATURE:** **Date:**

Name			
	First	Middle Initial	Family Name
Residence			
	City	State/Foreign Country	Country of Citizenship
Mailing Address			
(include Zip Code)			

☐ FOR ADDITIONAL INVENTORS see attached page.

☐ See additional foreign priorities on attached page (incorporated herein by reference).

Atty. Dkt. No. P _____ (M#)

United States Patent & Trademark Office

Office of Initial Patent Examination -- Scanning Division

Application deficiencies found during scanning:

☐ Page(s)_____ of _____ were not present for scanning. (Document title)

☐ Page(s)_____ of _____ were not present for scanning. (Document title)

☑ ***Scanned copy is best available.*** 1) There is 1 page of drawing. Not 4.
2) Figures 2 and 3 are dark.